

SEQUENCE LISTING

<110> Tim Keith

<120> NOVEL HUMAN GENES RELATING TO RESPIRATORY DISEASES AND OBESITY

<130> HUM00-23

<141> 2000/07/28

<150> 60/211,749

<151> 2000/06/14

<150> 60/146,336

<151> 1999/07/30

<160> 11

<170> FastSEQ for Windows Version 4.0

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<212> DNA

<213> Homo sapiens

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Val	His	Glu	Leu	Pro	Thr	Ser	Ser	Pro	Gly	Arg	Asp	Pro	Gly	Ser	Thr
				85					90					95	
Asn	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly	Thr	Pro	Gly	Ser	Arg	Ala	Ala
			100					105					110		
His	Val	Leu	Ser	Arg	Arg	Gly	His	Arg	Val	His	Glu	Leu	Pro	Thr	Pro
		115					120					125			
Ser	Pro	Gly	Arg	Asp	Pro	Gly	Phe	Met	Ser	Cys	Pro	Arg	Pro	Leu	Gln
	130					135					140				
Glu	Gly	Thr	Arg	Val	His	Glu	Leu	Pro	Thr	Pro	Ser	Pro	Gly	Gly	Asp
145					150					155					160
Pro	Gly	Pro	Arg	Ala	Ala	His	Val	Val	Asn	Gly	Lys	Gly	Pro	Gly	Ser
				165					170					175	
Thr	Ser	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly	Thr	Arg	Val	His	Glu	Leu
			180					185					190		
Pro	Thr	Arg	Ser	Pro	Gly	Gly	Asp	Thr	Gly	Phe	Thr	Ser	Cys	Pro	Arg
		195					200					205			
Pro	Leu	Gln	Glu	Gly	Thr	Pro	Gly	Ser	Arg	Ala	Ala	His	Val	Leu	Ser
	210					215					220				
Arg	Arg	Gly	His	Arg	Val	His	Glu	Leu	Pro	Thr	Ser	Ser	Pro	Gly	Gly
225					230					235					240
Asp	Thr	Gly	Phe	Thr	Ser	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly	Thr	Pro
				245					250					255	
Gly	Ser	Arg	Ala	Ala	His	Val	Leu	Ser	Arg	Lys	Gly	Pro	Gly	Ser	Thr
			260					265					270		
Ser	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly	Thr	Pro	Gly	Ser	Arg	Ala	Ala
		275					280					285			
His	Ala	Leu	Ser	Arg	Lys	Gly	Pro	Arg	Val	Gln	Val	Ser	Cys	Arg	Pro
	290					295				300					
Thr	Ser	Cys	Leu	Cys	Val	Asn	Gln	Lys	Lys	Asp	Glu	Gln	Ala	Leu	
305					310					315					320
Leu	Ser	Leu	Gln	Ala	Gly	Phe	Gly	Gly	Gly	Ala	Gly	Ser	Pro	Ala	Ala
			325						330					335	
Pro	Ser	Leu	Ala	Gly	His	Pro	Val	Leu	Glu	Pro	Gln	Asn	Cys	Arg	Arg
			340					345					350		
Pro	Ala	Glu	Lys	Gly											

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 <212> DNA  
 <213> Homo sapiens

<220>  
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 <222> (3)...(1169)

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gct gcc cac gtc gtc tcc agg aag gga ccc ggg tcc acg agc tgc cca 95  
 Ala Ala His Val Val Ser Arg Lys Gly Pro Gly Ser Thr Ser Cys Pro  
 20 25 30

cgt cct ctc cag gaa agg acc cgg gtc cac gag ctg gcc acg tcc tct 143  
 Arg Pro Leu Gln Glu Arg Thr Arg Val His Glu Leu Ala Thr Ser Ser  
 35 40 45

gca gga agg gac ccc ggg tcc acg agc tgc cca cgt cct ctc cag gaa 191  
 Ala Gly Arg Asp Pro Gly Ser Thr Ser Cys Pro Arg Pro Leu Gln Glu  
 50 55 60

ggg acc ccg ggt tca cga gct gcc cac gtc ctc tcc agg aag gga ccc 239  
 Gly Thr Pro Gly Ser Arg Ala Ala His Val Leu Ser Arg Lys Gly Pro  
 65 70 75

cgg gtc cac gag ctg ccc acg tcc tct cca gga agg gac ccc ggg tcc 287  
 Arg Val His Glu Leu Pro Thr Ser Ser Pro Gly Arg Asp Pro Gly Ser  
 80 85 90 95

acg aac tgc cca cgt cct ctc cag gaa ggg acc ccg ggt tca cga gct 335  
 Thr Asn Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala  
 100 105 110

gcc cac gtc ctc tcc agg agg gga cac cgg gtt cac gag ctg ccc acg 383  
 Ala His Val Leu Ser Arg Arg Gly His Arg Val His Glu Leu Pro Thr  
 115 120 125

ccc tct cca gga agg gac ccc ggg ttc atg agc tgc cca cgt cct ctc 431  
 Pro Ser Pro Gly Arg Asp Pro Gly Phe Met Ser Cys Pro Arg Pro Leu  
 130 135 140

cag gaa ggg acc cgg gtc cac gaa ctg ccc acg ccc tct cca gga ggg 479  
 Gln Glu Gly Thr Arg Val His Glu Leu Pro Thr Pro Ser Pro Gly Gly  
 145 150 155

gac ccg ggt cca cga gct gcc cac gtc gtc aac ggg aag gga ccc ggg 527  
 Asp Pro Gly Pro Arg Ala Ala His Val Val Asn Gly Lys Gly Pro Gly  
 160 165 170 175

CCDS:CCDS1000.1



tcc Ser	acg Thr	agc Ser	tgc Cys	cca Pro	cg Arg	cct Pro	ctc Leu	cag Gln	gaa Glu	ggg Gly	acc Thr	cgg Arg	gtc Val	cac His	gaa Glu	575		
180																185	190	
ctg Leu	ccc Pro	acg Thr	cgc Arg	tct Ser	cca Pro	gga Gly	ggg Gly	gac Asp	acc Thr	ggg Gly	ttc Phe	acg Thr	agc Ser	tgc Cys	cca Pro	623		
195																200	205	
cgc Arg	cct Pro	ctc Leu	cag Gln	gaa Glu	ggg Gly	acc Thr	ccg Pro	ggt Gly	tca Ser	cga Arg	gct Ala	gcc Ala	cac His	gtc Val	ctc Leu	671		
210																215	220	
tcc Ser	agg Arg	agg Arg	gga Gly	cac His	cgg Arg	gtt Val	cac His	gag Glu	ctg Leu	ccc Pro	acg Thr	tcc Ser	tct Ser	cca Pro	gga Gly	719		
225																230	235	
ggg Gly	gac Asp	acc Thr	ggg Gly	ttc Phe	acg Thr	agc Ser	tgc Cys	cca Pro	cgc Arg	cct Pro	ctc Leu	cag Gln	gag Glu	ggg Gly	aca Thr	767		
240																245	250	255
ccg Pro	ggt Gly	tca Ser	cga Arg	gct Ala	gcc Ala	cac His	gtc Val	ctc Leu	tcc Ser	agg Arg	aag Lys	gga Gly	ccc Pro	ggg Gly	tcc Ser	815		
260																265	270	
acg Thr	agc Ser	tgc Cys	cca Pro	cg Arg	cct Pro	ctc Leu	cag Gln	gag Glu	ggg Gly	aca Thr	ccg Pro	ggt Gly	tca Ser	cga Arg	gct Ala	863		
275																280	285	
gcc Ala	cac His	gca Ala	ctt Leu	tcc Ser	agg Arg	aag Lys	gga Gly	ccc Pro	cgg Arg	gtt Val	cag Gln	gtc Val	tcc Ser	tgc Cys	cgg Arg	911		
290																295	300	
ccc Pro	aca Thr	tcg Ser	tgc Cys	ctt Leu	tgt Cys	gta Val	aat Asn	cag Gln	aag Lys	aaa Lys	gat Asp	gag Glu	gaa Glu	cag Gln	gcc Ala	959		
305																310	315	
ctc Leu	ctc Leu	tct Ser	ctc Leu	cag Gln	gca Ala	ggc Gly	ttt Phe	ggt Gly	gga Gly	ggg Gly	gct Ala	gga Gly	tct Ser	cct Pro	gcc Ala	1007		
320																325	330	335
gca Ala	cct Pro	tcc Ser	ctg Leu	gca Ala	ggg Gly	cac His	cct Pro	gtg Val	ctt Leu	gag Glu	ccc Pro	cag Gln	aac Asn	tgc Cys	agg Arg	1055		
340																345	350	
cgg Arg	ccg Pro	gca Ala	gag Glu	aag Lys	ggg Gly	tcc Ser	atg Met	atg Met	gcg Ala	cct Pro	cgg Arg	tgc Cys	gca Ala	gcc Ala	ttg Leu	1103		
355																360	365	
gac Asp	ctg Leu	ccc Pro	cca Pro	tgg Trp	acc Thr	tgg Trp	aga Arg	cag Gln	ggt Gly	ttc Phe	tcc Ser	tca Ser	ttg Leu	gcc Ala	agg Arg	1151		
370																375	380	
ctg Leu	gtc Val	tcg Ser	aac Asn	tcc Ser	tga *	cctcagacga	tccacctgcc	tcagcctccc								1199		
385																		
gaagtgttg gattacaggc acgagccact gtgcccgcc atcattcctt tttacgctg																1259		

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1379  
1439  
1441

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Ala	His	Val	Val	Ser	Arg	Lys	Gly	Pro	Gly	Ser	Thr	Ser	Cys 30	Pro	Arg		
Pro	Leu	Gln	Glu	Arg	Thr	Arg	Val	His	Glu	Leu	Ala	Thr	Ser	Ser	Ala		
Gly	Arg	Asp	Pro	Gly	Ser	Thr	Ser	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly		
Thr 65	Pro	Gly	Ser	Arg	Ala 70	His	Val	Leu	Ser	Arg	Lys	Gly	Pro	Arg			
Val	His	Glu	Leu	Pro	Thr	Ser	Ser	Pro	Gly 90	Arg	Asp	Pro	Gly	Ser	Thr		
Asn	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly 105	Thr	Pro	Gly	Ser	Arg	Ala	Ala		
His	Val	Leu	Ser	Arg	Arg	Gly	His	Arg	Val	His	Glu	Leu	Pro	Thr	Pro		
Ser	Pro	Gly	Arg	Asp	Pro	Gly	Phe	Met	Ser	Cys	Pro	Arg	Pro	Leu	Gln		
Glu 145	Gly	Thr	Arg	Val	His	Glu	Leu	Pro	Thr	Pro	Ser	Pro	Gly	Gly	Asp		
Pro	Gly	Pro	Arg	Ala	Ala	His	Val	Val	Asn	Gly	Lys	Gly	Pro	Gly	Ser		
Thr	Ser	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly 185	Thr	Arg	Val	His	Glu	Leu		
Pro	Thr	Arg	Ser	Pro	Gly	Gly	Asp	Thr	Gly	Phe	Thr	Ser	Cys	Pro	Arg		
Pro	Leu	Gln	Glu	Gly	Thr	Pro	Gly	Ser	Arg	Ala	Ala	His	Val	Leu	Ser		
Arg 225	Arg	Gly	His	Arg	Val	His	Glu	Leu	Pro	Thr	Ser	Ser	Pro	Gly	Gly		
Asp	Thr	Gly	Phe	Thr	Ser	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly	Thr	Pro		
Gly	Ser	Arg	Ala	Ala	His	Val	Leu	Ser	Arg	Lys	Gly	Pro	Gly	Ser	Thr		
Ser	Cys	Pro	Arg	Pro	Leu	Gln	Glu	Gly	Thr	Pro	Gly	Ser	Arg	Ala	Ala		
His	Ala	Leu	Ser	Arg	Lys	Gly	Pro	Arg	Val	Gln	Val	Ser	Cys	Arg	Pro		
Thr 305	Ser	Cys	Leu	Cys	Val	Asn	Gln	Lys	Lys	Asp	Glu	Glu	Gln	Ala	Leu		
Leu	Ser	Leu	Gln	Ala	Gly	Phe	Gly	Gly	Gly	Ala	Gly	Ser	Pro	Ala	Ala		
Pro	Ser	Leu	Ala	Gly	His	Pro	Val	Leu	Glu	Pro	Gln	Asn	Cys	Arg	Arg		
Pro	Ala	Glu	Lys	Gly	Ser	Met	Met	Ala	Pro	Arg	Cys	Ala	Ala	Leu	Asp		

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 Val Ser Asn Ser  
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 <212> DNA  
 <213> Homo sapiens

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 <222> (3)...(1193)

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 gct gcc cac gtc gtc tcc agg aag gga ccc ggg tcc acg agc tgc cca 95  
 Ala Ala His Val Val Ser Arg Lys Gly Pro Gly Ser Thr Ser Cys Pro  
 20 25 30  
 cgt cct ctc cag gaa agg acc cgg gtc cac gag ctg gcc acg tcc tct 143  
 Arg Pro Leu Gln Glu Arg Thr Arg Val His Glu Leu Ala Thr Ser Ser  
 35 40 45  
 gca gga agg gac ccc ggg tcc acg agc tgc cca cgt cct ctc cag gaa 191  
 Ala Gly Arg Asp Pro Gly Ser Thr Ser Cys Pro Arg Pro Leu Gln Glu  
 50 55 60  
 ggg acc ccg ggt tca cga gct gcc cac gtc ctc tcc agg aag gga ccc 239  
 Gly Thr Pro Gly Ser Arg Ala Ala His Val Leu Ser Arg Lys Gly Pro  
 65 70 75  
 cgg gtc cac gag ctg ccc acg tcc tct cca gga agg gac ccc ggg tcc 287  
 Arg Val His Glu Leu Pro Thr Ser Ser Pro Gly Arg Asp Pro Gly Ser  
 80 85 90 95  
 acg aac tgc cca cgt cct ctc cag gaa ggg acc ccg ggt tca cga gct 335  
 Thr Asn Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala  
 100 105 110  
 gcc cac gtc ctc tcc agg agg gga cac cgg gtt cac gag ctg ccc acg 383  
 Ala His Val Leu Ser Arg Arg Gly His Arg Val His Glu Leu Pro Thr  
 115 120 125  
 ccc tct cca gga agg gac ccc ggg ttc atg agc tgc cca cgt cct ctc 431  
 Pro Ser Pro Gly Arg Asp Pro Gly Phe Met Ser Cys Pro Arg Pro Leu  
 130 135 140  
 cag gaa ggg acc cgg gtc cac gaa ctg ccc acg ccc tct cca gga ggg 479  
 Gln Glu Gly Thr Arg Val His Glu Leu Pro Thr Pro Ser Pro Gly Gly  
 145 150 155

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gac Asp 160	ccg Pro	ggt Gly	cca Pro	cga Arg	gct Ala 165	gcc Ala	cac His	gtc Val	gtc Val	aac Asn 170	ggg Gly	aag Lys	gga Gly	ccc Pro	ggg Gly	527
tcc Ser	acg Thr	agc Ser	tgc Cys	cca Pro 180	cg Arg	cct Pro	ctc Leu	cag Gln	gaa Glu 185	ggg Gly	acc Thr	cgg Arg	gtc Val	cac His 190	gaa Glu	575
ctg Leu	ccc Pro	acg Thr	cgc Arg 195	tct Ser	cca Pro	gga Gly	ggg Gly	gac Asp 200	acc Thr	ggg Gly	ttc Phe	acg Thr	agc Ser 205	tgc Cys	cca Pro	623
cgc Arg	cct Pro	ctc Leu 210	cag Gln	gaa Glu	ggg Gly	acc Thr	ccg Pro 215	ggt Gly	tca Ser	cga Arg	gct Ala	gcc Ala 220	cac His	gtc Val	ctc Leu	671
tcc Ser 225	agg Arg	agg Arg	gga Gly	cac His	cgg Arg	gtt Val 230	cac His	gag Glu	ctg Leu	ccc Pro 235	acg Thr	tcc Ser	tct Ser	cca Pro	gga Gly	719
ggg Gly 240	gac Asp	acc Thr	ggg Gly	ttc Phe	acg Thr 245	agc Ser	tgc Cys	cca Pro	cgc Arg	cct Pro 250	ctc Leu	cag Gln	gag Glu	ggg Gly	aca Thr 255	767
ccg Pro	ggt Gly	tca Ser	cga Arg 260	gct Ala	gcc Ala	cac His	gtc Val	ctc Leu	tcc Ser 265	agg Arg	aag Lys	gga Gly	ccc Pro	ggg Gly 270	tcc Ser	815
acg Thr	agc Ser	tgc Cys	cca Pro 275	cg Arg	cct Pro	ctc Leu	cag Gln	gag Glu	ggg Gly	aca Thr	ccg Pro	ggt Gly	tca Ser 285	cga Arg	gct Ala	863
gcc Ala	cac His	gca Ala 290	ctt Leu	tcc Ser	agg Arg	aag Lys	gga Gly 295	ccc Pro	cgg Arg	gtt Val	cag Gln	gtc Val 300	tcc Ser	tgc Cys	cgg Arg	911
ccc Pro	aca Thr 305	tcg Ser	tgc Cys	ctt Leu	tgt Cys	gta Val 310	aat Asn	cag Gln	aag Lys	aaa Lys 315	gat Asp	gag Glu	gaa Glu	cag Gln	gcc Ala	959
ctc Leu 320	ctc Leu	tct Ser	ctc Leu	cag Gln	gca Ala 325	ggc Gly	ttt Phe	ggt Gly	gga Gly	ggg Gly 330	gct Ala	gga Gly	tct Ser	cct Pro	gcc Ala 335	1007
gca Ala	cct Pro	tcc Ser	ctg Leu	gca Ala 340	ggg Gly	cac His	cct Pro	gtg Val	ctt Leu 345	gag Glu	ccc Pro	cag Gln	aac Asn	tgc Cys 350	agg Arg	1055
cgg Arg	ccg Pro	gca Ala	gag Glu 355	aag Lys	ggg Gly	tcc Ser	atg Met	atg Met 360	gcg Ala	cct Pro	cgg Arg	tgc Cys	gca Ala	gcc Ala	ttg Leu	1103
gac Asp	ctg Leu	ccc Pro 370	cca Pro	tgg Trp	acc Thr	tgg Trp	gaa Glu 375	cct Pro	ccc Pro	ggc Gly	tct Ser	tcc Ser 380	cac His	tcg Ser	gga Gly	1151

aag gaa ggc tct ggg cat gga gct tta ttg agg tat agt tga 1193  
Lys Glu Gly Ser Gly His Gly Ala Leu Leu Arg Tyr Ser \*  
385 390 395

caattcagga cgggtgtgcac tcaaggatat cagcatcaca acctgacaca cgtaggcatt 1253  
gtgaaatgag tcccacaatt gggctaatta acacacccat caccttacat gggtacttct 1313  
ttctgtggtg agaacactaa attttaata gaggacacac agcctgggca acatagttag 1373  
accctgtctc taaaaatata aaaaaattat ctggacgtgg tgggtgcacac ctgtgggtccc 1433  
agctacttgg gaagctgagg ctggagaatc acttgagcct gggagggcga ggttgcggtg 1493  
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tcttatcaaa aaaaaaaaaa aaa 1576

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<211> 396  
<212> PRT  
<213> Homo sapiens

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Pro Leu Gln Glu Arg Thr Arg Val His Glu Leu Ala Thr Ser Ser Ala  
35 40 45  
Gly Arg Asp Pro Gly Ser Thr Ser Cys Pro Arg Pro Leu Gln Glu Gly  
50 55 60  
Thr Pro Gly Ser Arg Ala Ala His Val Leu Ser Arg Lys Gly Pro Arg  
65 70 75 80  
Val His Glu Leu Pro Thr Ser Ser Pro Gly Arg Asp Pro Gly Ser Thr  
85 90 95  
Asn Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala Ala  
100 105 110  
His Val Leu Ser Arg Arg Gly His Arg Val His Glu Leu Pro Thr Pro  
115 120 125  
Ser Pro Gly Arg Asp Pro Gly Phe Met Ser Cys Pro Arg Pro Leu Gln  
130 135 140  
Glu Gly Thr Arg Val His Glu Leu Pro Thr Pro Ser Pro Gly Gly Asp  
145 150 155 160  
Pro Gly Pro Arg Ala Ala His Val Val Asn Gly Lys Gly Pro Gly Ser  
165 170 175  
Thr Ser Cys Pro Arg Pro Leu Gln Glu Gly Thr Arg Val His Glu Leu  
180 185 190  
Pro Thr Arg Ser Pro Gly Gly Asp Thr Gly Phe Thr Ser Cys Pro Arg  
195 200 205  
Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala Ala His Val Leu Ser  
210 215 220  
Arg Arg Gly His Arg Val His Glu Leu Pro Thr Ser Ser Pro Gly Gly  
225 230 235 240  
Asp Thr Gly Phe Thr Ser Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro  
245 250 255  
Gly Ser Arg Ala Ala His Val Leu Ser Arg Lys Gly Pro Gly Ser Thr  
260 265 270  
Ser Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala Ala  
275 280 285  
His Ala Leu Ser Arg Lys Gly Pro Arg Val Gln Val Ser Cys Arg Pro  
290 295 300

Thr Ser Cys Leu Cys Val Asn Gln Lys Lys Asp Glu Glu Gln Ala Leu  
 305 310 315 320  
 Leu Ser Leu Gln Ala Gly Phe Gly Gly Gly Ala Gly Ser Pro Ala Ala  
 325 330 335  
 Pro Ser Leu Ala Gly His Pro Val Leu Glu Pro Gln Asn Cys Arg Arg  
 340 345 350  
 Pro Ala Glu Lys Gly Ser Met Met Ala Pro Arg Cys Ala Ala Leu Asp  
 355 360 365  
 Leu Pro Pro Trp Thr Trp Glu Pro Pro Gly Ser Ser His Ser Gly Lys  
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 Glu Gly Ser Gly His Gly Ala Leu Leu Arg Tyr Ser  
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<210> 8

<211> 2010

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (3)...(1247)

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Ala Ala His Val Val Ser Arg Lys Gly Pro Gly Ser Thr Ser Cys Pro	
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cgt cct ctc cag gaa agg acc ccg gtc cac gag ctg gcc acg tcc tct	143
Arg Pro Leu Gln Glu Arg Thr Arg Val His Glu Leu Ala Thr Ser Ser	
35 40 45	
gca gga agg gac ccc ggg tcc acg agc tgc cca cgt cct ctc cag gaa	191
Ala Gly Arg Asp Pro Gly Ser Thr Ser Cys Pro Arg Pro Leu Gln Glu	
50 55 60	
ggg acc ccg ggt tca cga gct gcc cac gtc ctc tcc agg aag gga ccc	239
Gly Thr Pro Gly Ser Arg Ala Ala His Val Leu Ser Arg Lys Gly Pro	
65 70 75	
cgg gtc cac gag ctg ccc acg tcc tct cca gga agg gac ccc ggg tcc	287
Arg Val His Glu Leu Pro Thr Ser Ser Pro Gly Arg Asp Pro Gly Ser	
80 85 90 95	
acg aac tgc cca cgt cct ctc cag gaa ggg acc ccg ggt tca cga gct	335
Thr Asn Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala	
100 105 110	
gcc cac gtc ctc tcc agg agg gga cac cgg gtt cac gag ctg ccc acg	383
Ala His Val Leu Ser Arg Arg Gly His Arg Val His Glu Leu Pro Thr	
115 120 125	

CCDS: M36123.1

ccc Pro	tct Ser	cca Pro 130	gga Gly	agg Arg	gac Asp	ccc Pro	ggg Gly 135	ttc Phe	atg Met	agc Ser	tgc Cys 140	cca Pro	cgt Arg	cct Pro	ctc Leu	431
cag Gln 145	gaa Glu	ggg Gly	acc Thr	cgg Arg	gtc Val	cac His 150	gaa Glu	ctg Leu	ccc Pro	acg Thr	ccc Pro 155	tct Ser	cca Pro	gga Gly	ggg Gly	479
gac Asp 160	ccg Pro	ggt Gly	cca Pro	cga Arg	gct Ala 165	gcc Ala	cac His	gtc Val	gtc Val	aac Asn 170	ggg Gly	aag Lys	gga Gly	ccc Pro	ggg Gly 175	527
tcc Ser	acg Thr	agc Ser	tgc Cys	cca Pro 180	cgt Arg	cct Pro	ctc Leu	cag Gln	gaa Glu 185	ggg Gly	acc Thr	cgg Arg	gtc Val	cac His 190	gaa Glu	575
ctg Leu	ccc Pro	acg Thr	cgc Arg 195	tct Ser	cca Pro	gga Gly	ggg Gly	gac Asp 200	acc Thr	ggg Gly	ttc Phe	acg Thr	agc Ser	tgc Cys	cca Pro	623
cgc Arg	cct Pro	ctc Leu 210	cag Gln	gaa Glu	ggg Gly	acc Thr 215	ccg Pro	ggt Gly	tca Ser	cga Arg	gct Ala 220	gcc Ala	cac His	gtc Val	ctc Leu	671
tcc Ser 225	agg Arg	agg Arg	gga Gly	cac His	cgg Arg	gtt Val 230	cac His	gag Glu	ctg Leu	ccc Pro	acg Thr 235	tcc Ser	tct Ser	cca Pro	gga Gly	719
ggg Gly 240	gac Asp	acc Thr	ggg Gly	ttc Phe	acg Thr 245	agc Ser	tgc Cys	cca Pro	cgc Arg	cct Pro 250	ctc Leu	cag Gln	gag Glu	ggg Gly	aca Thr 255	767
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acg Thr	agc Ser	tgc Cys	cca Pro 275	cgt Arg	cct Pro	ctc Leu	cag Gln	gag Glu 280	ggg Gly	aca Thr	ccg Pro	ggt Gly	tca Ser 285	cga Arg	gct Ala	863
gcc Ala	cac His	gca Ala 290	ctt Leu	tcc Ser	agg Arg	aag Lys	gga Gly 295	ccc Pro	cgg Arg	gtt Val	cag Gln 300	gtc Val	tcc Ser	tgc Cys	cgg Arg	911
ccc Pro	aca Thr 305	tcg Ser	tgc Cys	ctt Leu	tgt Cys	gta Val 310	aat Asn	cag Gln	aag Lys	aaa Lys 315	gat Asp	gag Glu	gaa Glu	cag Gln	gcc Ala	959
ctc Leu 320	ctc Leu	tct Ser	ctc Leu	cag Gln	gca Ala 325	ggc Gly	ttt Phe	ggt Gly	gga Gly	ggg Gly 330	gct Ala	gga Gly	tct Ser	cct Pro	gcc Ala 335	1007
gca Ala	cct Pro	tcc Ser	ctg Leu	gca Ala 340	ggg Gly	cac His	cct Pro	gtg Val	ctt Leu	gag Glu 345	ccc Pro	cag Gln	aac Asn	tgc Cys 350	agg Arg	1055

cgg ccg gca gag aag ggg tcc atg atg gcg cct cgg tgc gca gcc ttg 1103  
Arg Pro Ala Glu Lys Gly Ser Met Met Ala Pro Arg Cys Ala Ala Leu  
355 360 365

gac ctg ccc cca tgg acc tgg atg cca gtg atg cct gag gtc tgc acg 1151  
Asp Leu Pro Pro Trp Thr Trp Met Pro Val Met Pro Glu Val Cys Arg  
370 375 380

gca gtg cat acg ctc acc gcc tgg ccg ctc agg agc ctg tgc ttg acc 1199  
Ala Val His Thr Leu Thr Ala Trp Pro Leu Arg Ser Leu Cys Leu Thr  
385 390 395

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Pro Lys Ser Ala Pro Gln Leu Pro Val Thr Gly Ser Leu Leu Pro \*  
400 405 410

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Gly Arg Asp Pro Gly Ser Thr Ser Cys Pro Arg Pro Leu Gln Glu Gly  
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Thr Pro Gly Ser Arg Ala Ala His Val Leu Ser Arg Lys Gly Pro Arg  
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Val His Glu Leu Pro Thr Ser Ser Pro Gly Arg Asp Pro Gly Ser Thr  
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Asn Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala Ala  
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His Val Leu Ser Arg Arg Gly His Arg Val His Glu Leu Pro Thr Pro  
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Ser Pro Gly Arg Asp Pro Gly Phe Met Ser Cys Pro Arg Pro Leu Gln  
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Glu Gly Thr Arg Val His Glu Leu Pro Thr Pro Ser Pro Gly Gly Asp  
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Pro Gly Pro Arg Ala Ala His Val Val Asn Gly Lys Gly Pro Gly Ser  
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 Pro Leu Gln Glu Gly Thr Pro Gly Ser Arg Ala Ala His Val Leu Ser  
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 Arg Arg Gly His Arg Val His Glu Leu Pro Thr Ser Ser Pro Gly Gly  
 225 230 235 240  
 Asp Thr Gly Phe Thr Ser Cys Pro Arg Pro Leu Gln Glu Gly Thr Pro  
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 Gly Ser Arg Ala Ala His Val Leu Ser Arg Lys Gly Pro Gly Ser Thr  
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 His Ala Leu Ser Arg Lys Gly Pro Arg Val Gln Val Ser Cys Arg Pro  
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 Pro Ala Glu Lys Gly Ser Met Met Ala Pro Arg Cys Ala Ala Leu Asp  
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cgt cct ctc cag gaa agg acc cgg gtc cac gag ctg gcc acg tcc tct  
 Arg Pro Leu Gln Glu Arg Thr Arg Val His Glu Leu Ala Thr Ser Ser  
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47

95

143

CCDC103

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ggg Gly	acc Thr 65	ccg Pro	ggt Gly	tca Ser	cga Arg	gct Ala 70	gcc Ala	cac His	gtc Val	ctc Leu	tcc Ser 75	agg Arg	aag Lys	gga Gly	ccc Pro	239
cgg Arg 80	gtc Val	cac His	gag Glu	ctg Leu	ccc Pro 85	acg Thr	tcc Ser	tct Ser	cca Pro	gga Gly 90	agg Arg	gac Asp	ccc Pro	ggg Gly	tcc Ser 95	287
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Ala	His	Ala	Leu	Ser	Arg	Lys	Gly	Pro	Arg	Val	Gln	Val	Ser	Cys	Arg	
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Pro	Thr	Ser	Cys	Leu	Cys	Val	Asn	Gln	Lys	Lys	Asp	Glu	Glu	Gln	Ala	
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Leu	Leu	Ser	Leu	Gln	Ala	Gly	Phe	Gly	Gly	Gly	Ala	Gly	Ser	Pro	Ala	
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Ala	Pro	Ser	Leu	Ala	Gly	His	Pro	Val	Leu	Glu	Pro	Gln	Asn	Cys	Arg	
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Arg	Pro	Ala	Glu	Lys	Gly	Ser	Met	Met	Ala	Pro	Arg	Cys	Ala	Ala	Leu	
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Asp	Leu	Pro	Pro	Trp	Thr	Trp	Glu	Pro	Pro	Gly	Ser	Ser	His	Ser	Gly	
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Lys	Glu	Gly	Ser	Gly	His	Gly	Gly	Arg	Pro	Gly	Pro	Ile	Pro	Val	Pro	
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tgg	ccc	ttc	ttc	ctg	ctt	cct	gtt	tgt	cac	tgc	ccc	ggg	gcc	ttt	gca	1247
Trp	Pro	Phe	Phe	Leu	Leu	Pro	Val	Cys	His	Cys	Pro	Gly	Ala	Phe	Ala	
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Pro	Ala	Phe	Pro	Leu	Ser	Val	Ser	Val	Leu	Gly	Pro	Val	Thr	His	Val	
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Thr	Val	Pro	Gly	Tyr	Leu	Phe	Phe	Ser	Phe	Ser	Leu	Ser	Ser	Phe	Ile	
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Glu	Val	*														
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Pro	Leu	Gln	Glu	Arg	Thr	Arg	Val	His	Glu	Leu	Ala	Thr	Ser	Ser	Ala	
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Pro	Leu	Gln	Glu	Gly	Thr	Pro	Gly	Ser	Arg	Ala	Ala	His	Val	Leu	Ser	
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Gly	Ser	Arg	Ala	Ala	His	Val	Leu	Ser	Arg	Lys	Gly	Pro	Gly	Ser	Thr	
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				325				330						335		
Pro	Ser															

$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$